

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~striketrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please CANCEL claims 8 and 18, and AMEND claims 4, 5, 12, 19, 20, and 22 in accordance with the following:

1-3. (CANCELED)

4. (CURRENTLY AMENDED) A fixing device of an image forming apparatus comprising a heat roller and a pressure roller, the heat roller comprising:
a roller support frame fixedly installed within the heat roller;
a film tube supported by the roller support frame; and
a heat transfer unit transferring radiation energy toward a part of the film tube that is in contact with the pressure roller wherein the heat transfer unit comprises:
a halogen lamp generating light energy,
a blackbody converting the light energy emitted from the halogen lamp into heat energy,
and
a radiation energy converging unit converging the light energy emitted from the halogen lamp onto the blackbody, wherein a material is coated on an external surface of the blackbody, the material comprising a material with a high light transmittance and a low heat conductivity as compared to the blackbody.

5. (CURRENTLY AMENDED) A fixing device of an image forming apparatus comprising a heat roller and a pressure roller, the heat roller comprising:
a roller support frame fixedly installed within the heat roller;
a film tube supported by the roller support frame; and
a heat transfer unit transferring radiation energy toward a part of the film tube that is in contact with the pressure roller,
wherein:
the heat transfer unit comprises:

a halogen lamp generating light energy,
a blackbody converting the light energy emitted from the halogen lamp
into heat energy, and

a radiation energy converging unit converging the light energy emitted
from the halogen lamp onto the blackbody

the radiation energy converging unit comprises:

a quartz glass plate transmitting the light energy emitted from the halogen
lamp, and

a reflector reflecting the light energy emitted from the halogen lamp
towards the quartz glass plate.

6. (ORIGINAL) The fixing device according to claim 5, wherein the reflector is
installed above the quartz glass plate to enclose the halogen lamp.

7. (PREVIOUSLY PRESENTED) The fixing device according to claim 4, further
comprising:

a thermal grease applied on an external surface of the blackbody.

8. (CANCELLED)

9. (PREVIOUSLY PRESENTED) The fixing device according to claim 5, wherein
the blackbody has an absorption property corresponding to the emitted light energy.

10. (ORIGINAL) The fixing device according to claim 5, wherein the thickness of the
quartz glass plate is not greater than 5 mm.

11. (CANCELED)

12. (CURRENTLY AMENDED) An image forming apparatus to form a toner image on
an image forming medium, comprising:

a heat roller;

a pressure roller, wherein a paper passes between the heat roller and the pressure roller;

and

a focusing device focusing heat on a position where the heat roller and the pressure

roller engage with each other to fix a toner image onto the image forming medium;

wherein:

the heat roller comprises:

a film tube forming an outermost layer of the heat roller and rotating in a linear speed same as that of the heat roller,

a roller support frame supporting the film tube, and

a heat transfer unit;

the heat transfer unit comprises:

a halogen lamp emitting radiation energy, and

a black-body converting the radiation energy into heat energy; and

a radiation energy converging unit comprising

a reflector having a top and both sides of the halogen lamp and spaced from the halogen lamp, and

a quartz glass plate installed below the halogen lamp and spaced from the halogen lamp and in contact with a top of the black body.

13. (ORIGINAL) The image forming apparatus of claim 12, the film tube is formed of polyimide and is coated with PFA or PTFE on a surface thereof.

14. (ORIGINAL) The image forming apparatus of claim 12, wherein the roller support frame is secured with the heat roller together with the heat transfer unit.

15. (ORIGINAL) The image forming apparatus of claim 12, wherein only the film tube is engaged and rotated with the pressure roller.

16. (CANCELED)

17. (PREVIOUSLY PRESENTED) The image forming apparatus of claim 12, wherein the black body is a light-to-heat converting element comprising a glass coating or a thermal grease on an external surface thereof.

18. (CANCELLED)

19. (CURRENTLY AMENDED) The image forming apparatus of claim ~~18~~12, wherein

the reflector comprises an inverted U-shape and reflects the radiation energy emitted from the halogen lamp to an underside of the halogen lamp.

20. (CURRENTLY AMENDED) The image forming apparatus of claim ~~48~~12, wherein the quartz glass plate comprises a thickness not greater than 5 mm so that the light-to-heat converting element is heated to a fixing temperature within a short length of time.

21. (CANCELLED)

22. (CURRENTLY AMENDED) The image forming apparatus of claim ~~48~~12, wherein: the radiation energy emitted by the halogen lamp is reflected by the reflector and converged onto the quartz glass plate, and the quartz glass plate is disposed between the reflector and the black-body such that the radiation energy converged onto the quartz glass plate is transmitted to the black-body.

23. (PREVIOUSLY PRESENTED) The image forming apparatus of claim 22, wherein the quartz glass plate comprises good light transmittance and most of the radiation energy is transferred to the black body, which is in contact with a lower surface of the quartz glass plate, and the transferred radiation energy is converted into heat energy while being absorbed by the black-body.

24. (PREVIOUSLY PRESENTED) The image forming apparatus of claim 23, wherein the quartz glass plate has a heat conductivity where most of the heat energy converted by the black-body is used to increase a temperature of the pressure roller to fix the toner image onto the image forming medium.

25. (ORIGINAL) The image forming apparatus of claim 24, wherein the film tube is supported by the roller support frame and is rotated while engaged with the pressure roller with a predetermined pressure.

26. (ORIGINAL) The image forming apparatus of claim 25, wherein the film tube receives the heat from the black-body and transfers the heat to the image forming medium.